THE CHRONICLE
of Early American Industries

VOLUME III, No. 11 MARCH, 1947

Flax and the Loom

by JARED VAN WAGENEN

I suppose that the most important of the household handicrafts—one which a century ago was well-nigh universal on all our farms—was the textile art as expressed in wool and linen. It would seem that there was a day when a plot of flax was found on every well-ordered farm, just as there was a wheel for flax and another for wool and a big "barn-frame" loom in every kitchen. Flax was grown in the colony of New Netherlands as early as 1626 and always thereafter had a most important place in the farm economy of the pioneer.

The Growing of Flax

In 1844 (I must again refer to this oft-quoted year simply because it is the earliest landmark in our agricultural crop statistics) we had more than 46,000 acres of flax—mostly in small areas. It is doubtful if the busiest farmstead would require for its own use more than an acre, but if there was a surplus, dressed flax was one of the few commodities that enjoyed a dependable cash market. Ten years later this area had fallen to less than 13,000 acres—testimony of how rapidly household spinning and weaving was going out. Under the stress of the Civil War with famine prices for cotton and probably the patriotic appeal for national self-sufficiency, the dying art flared up again so that in 1864 we grew more than 18,000 acres, but it was the last stand of the flax wheel. Never again did the census enumerator find any considerable area of flax and for fifty years the crop has been practically extinct in our state. Indeed I think it very probable that flax production

Continued on page 95

The American Rifle and Firearms Industry

by CARL W. DREPPERD

The so-called Kentucky rifle, which is really a Pennsylvania rifle, went into production long before the name Kentucky was known. The industry began with the erection, near Lancaster, Pa., in 1719, of a gunbarrel boring-mill by Martin Meylan, a Swiss emigrant. Two years later, again near Lancaster, Peter Laman, a French Huguenot, erected a gun-barrel boring-mill. Thus, early in the 18th century, Lancaster became the center of a gun smithing trade and rifle production. Names in the history of early Pennsylvania rifle making were Feree, Folect, Lefevre, Roesser, Dreppard and Henry. The most famous man in Pennsylvania gun making is, perhaps, William Henry, who not only understood and applied repetitive manufacturing to guns during the Revolution but was the first American to build and run a steamboat. His first steamboat, tried out on the Conestoga River in 1763, was the boat that Henry told John Fitch about and also Robert Fulton.

Early in the history of gun making at Lancaster, we find certain of the smiths becoming specialists, either in the making of barrels, or the rifling of barrels, or the making of locks—to a standard. By 1770 the gunsmiths of Lancaster supported two rifling mills to which they sent their barrels for this all important treatment. Daniel Boone, according to tradition, came to Lancaster to buy a rifle, with which he won a number of shooting matches. His entire company were equipped with Lancaster rifles on their movement into the Kentucky country. But it was not Daniel Boone's Kentucky exploits which

gave the Pennsylvania rifle the wrong name "Kentucky rifle." That name was given after 1815 because of the popular song, "Kentucky Riflemen," which dealt with the exploits of Andrew Jackson's sharpshooters at the battle of New Orleans.

It is within the history of gun making in America that we find the beginning of interchangeability of parts and the inevitable result, mass production. In 1798 the United States Government made a contract for a large number of guns with Eli Whitney, of New Haven. Whitney went to Washington with all the parts required to make ten muskets. Without any tools the Secretary of War and a group of army officers assembled ten complete muskets from these parts. They considered this an amazing achievement. It was. Thomas Jefferson, in a letter to James Monroe in 1801, said of Whitney: "He has invented molds and machines for making all the pieces so exactly alike that, take 100 of his (gun) locks to pieces and mingle their parts, and then 100 locks may be put together again by taking the pieces which come to hand."

Compared to this achievement in 1798, we can look with less amazement at the Cadillac motor test which won the Dewar Trophy awarded by the Royal Automobile Club of London, England, in 1906. Three Cadillac cars were assembled in an open shed at the Brooklands Track from a medley of parts representing the dismantled components of three Cadillacs, taken from the dockside by Royal Automobile Club officials. The Cadillacs were reassembled from the heap of parts with no other tools than wrench, hammer, screw driver and pliers. The reassembled cars were then given a 500 mile test run and finished with a perfect score. What Cadillac did with motor cars in 1906, Eli Whitney did with rifles in 1798.

Simeon North who, in 1812 contracted to supply the government with 20,000 pistols, specified "the component parts of the pistols are to correspond so exactly that any limb or part of one pistol may be fitted into any pistol of the 20,000." He fulfilled exactly the terms of his contract.

E. Remington, on his farm at Ilion, New York, in 1829 established what later became the world-famous Remington Arms Company. He began making barrels by hand on his own anvil and then bored and rifled them with machinery devised by himself. But so good were his rifles that he soon set up special machinery and began making gun barrels for the United States Government. Later, he introduced a system of identical parts and complete interchangeability. It was said of Remington, early in its history, "Not only are Remington gun locks cheaper than any foreign locks, but each piece is uniform with others of the same description, thus providing for a vast saving of labor in assembling."

In 1820 a revolutionary patent was issued to Thomas Blanchard of Middlebury, Massachusetts. This was the famous Blanchard gunstock lathe, operating from a cam that followed a pattern and thus turned out of wood all manner of irregular shapes, such as gunstocks, shoe lasts, shoe heels, axe handles, wheel spokes and wig-blocks. The Blanchard patent was granted a renewal in 1834 and again in 1848. The application of Blanchard's techniques to metal working machinery resulted in the designing of the completely automatic shaping and screw cutting machines.

In 1835, Colt received a patent for his now famous repeating or revolving firearms. In 1836 Colt began production of this arm at Paterson, New Jersey. He suspended operations in 1842 for over four years but at the commencement of the Mexican War, resumed business at Hartford, Connecticut. Here again, it was interchangeability of parts that made for mass production of Colt's invention. The gun that made all men equal—the Smith and Wesson—went into production at Norwich, Conn., 1855, from which place the plant was removed to Springfield in 1856. These revolving firearms, made continuously since that time, in tremendous numbers, by machinery, have had a world-wide market. Oliver Winchester and B. T. Henry formed the Winchester Company by taking over the Volcanic Repeating Arms Company, organized 1854. In 1862, Richard Gatling obtained his initial patent on the grandfather of the machine gun. These guns were produced first by Greenwood of Cincinnati, and then by the Cooper Firearms Company of Philadelphia. In 1867 the Gatling Gun Company, a sales organization, was formed to sell the guns which were thereafter produced by the Colt Company.

Elsewhere in this brochure, mention is made of the mass production of weaving machinery, cotton gins and cards. One of the great producers in this category was Alfred Jenks of Philadelphia, who began business in 1810. In 1861 this firm, so well organized on the interchangeability-of-parts basis, reconverted a part of the factory for war work and produced 5,000 standard Springfield rifles a month.

Continued on page 96

Flax and the Loom—Continued

reached its high water mark even before the first crop census. It is interesting to record that one or two of our state hospitals for the insane still grow a little plot of flax because its preparation and spinning afford interesting occupation for their patients.

I have sought from many correspondents first-hand information concerning this old-time crop and details as to its culture, preparation and use. Many old men will remember the crop as a part of their youth, but there seems to be a lack of definite clean-cut memories. All agree in one statement—that the crop disappeared soon after the close of the Civil War. There were, however, several articles published in the *Cultivator* and the *American Agriculturist* during the decade 1840–50 relative to the raising of flax, and these were by men who had had experience with the matter of which they wrote. In the *Cultivator* for 1846 is a communication from one who hides his identity under the simple initial "B." He writes from Leyden, N. Y., and I assume that his experience represents a successful crop grown according to the accepted methods of that time. He sowed one acre of ground which had been stubble the previous year, using three pecks of seed. His harvest consisted of 15 bushels of seed, which he estimates as being worth one dollar per bushel, and 250 pounds of dressed flax fiber, worth $18.75. He places the cost of dressing the fiber at $6.25 and other labor, $2.00, and so estimates for himself the satisfactory gross profit of $25.50. It should be noted, however, that the best quality of fiber was not secured when the crop was allowed to ripen its seed.

Flax was sown as early in the spring as the ground could be well prepared and it was especially desirable that the land be free from weeds, not only because they interfered with the growth of the flax but even more because they were a great bother in subsequent handling. For this reason recently cleared and newly burned over land was sought and in the days when it was an important crop, such land was usually available. The plant grew from two to three feet tall and was ready to harvest in late July or early August. It was always "pulled," not cut, probably because this method permitted it to be put into the best condition for handling and also because longer fiber could be saved. Any breaking or tangling of the straw increased the labor of preparation and resulted in a less desirable product. The finest and silkiest fiber was secured by thick seeding and harvesting while still immature. Flax is a hollow-stemmed plant with long and wonderfully strong fibers or filaments which run the entire length of the stalk. The flax fiber, however, forms only a small part of the total weight. The part of the plant that is laid in and around the fibers has no textile value and must be gotten rid of before the flax can be prepared. This was done by "retting," that is, by exposing it to water in running streams; or, far more commonly, by laying it out on the grass in a thin layer until partially rotted. The two methods were called, respectively, "water retting" and "dew retting." Water retting was much quicker, being completed in from eight to twenty days, depending upon the maturity of the plant and the temperature of the water. It also gave better control of conditions and is the method used in countries where flax is grown commercially. Probably few farmers were fortunate enough to have a proper stream or water supply available.

In dew retting, the length of exposure varied with the weather and the maturity of the plant but usually occupied several weeks. As one correspondent puts it: "It laid out until it looked as if it was thoroughly spoiled." This was for the purpose of letting rotting go far enough so that the interfibrous portion of the plant partially decayed while the true fiber remained uninjured. There were certain rule-of-thumb tests by which to determine when the process had gone far enough. When the right stage was reached the retted flax was gathered up and thoroughly dried. On certain of the best-equipped farms there was a fire-heated loft or kiln for this special purpose.

Treatment of the Flax

The flax was then, a single handful at a time, broken on that primitive and universal implement, the "flax-brake" or "crackel." This was essentially a wooden beam four or five feet long supported, sawhorse fashion, at a height convenient for the operator. On top of this was a second beam hinged to the first at one end, and so arranged that the other end could be lifted and dropped by handpower. The handful of flax straw was vigorously pounded between the two beams until the "boon," or the non-fibrous portion of the plant, was thoroughly crushed and loosened from the true flax fiber. Then it was "switcheled" by beating it with a great wooden knife

Continued on page 99

A. Miner's Accelerating Wheel Head

by Ruth Gaines

In the various interesting and scholarly contributions to your columns on the spinning wheel, big and little, there is one device which I have not seen mentioned. It is (as printed on the label) "A. Miner's Patent Warranted Accelerating Wheel Head" for the big wool wheel. I shall confine myself to a notation of its appearance and effect on the wheel in this country.

Amos Miner patented his spinning head in Washington, D. C. in 1803. The accompanying illustration shows the mechanism of the head prior to this date, and shortly subsequent to it. The distinguishing feature of Miner's head is the additional pulley wheel A, magnifying the power of the original pulley or whirr B in rotating the spindle. A separate band C gears the upper accelerating pulley wheel to the lower. Also in this new type the big wheel itself is geared by its band to the grooved flange of the upper or accelerating wheel; in the old type it is geared to the tiny pulley or whirr on the spindle shaft (B).

So immediate and extensive was the response of the spinners to Miner's invention—for Amos made his head adjustable so that it could be inserted at once in any wheel, and furthermore pushed the gadget by manufacturing it in quantity and peddling it "from Maine to Georgia"—that today, North or South along main lines of travel and trade, the original old type wheel heads are a rarity.

The new invention did not penetrate the mountains, where the old type of wheel head still is in use. This is probably true because hand spinning was already on the wane, and time thus limited the distribution of the improved heads. In districts adjacent the weaving factories the hand wheel kept its place until the introduction of mechanized spinning, as the hand wheels were called on to supply the thread for the factory looms. This latter demand must have stimulated the use of the improved heads in such districts for some years. Farmers' wives and daughters were undoubtedly busily spinning to supply the humming weaving mills.

One beautiful example I have seen of the old type wheel head, in use by Mrs. Marion Drew at the Indian House at Deerfield, Massachusetts. This wheel has other distinguishing features, a grooved rim on the big wheel for the band, and shapely, streamlined spokes. I note in the illustrations of the recent article by John Maloney in *The Saturday Evening Post* (April 27, 1946) on the Walker sisters of the Great Smokies, that their wheel head is of the old type also—as one would expect of a home-made, mountain wheel.

Nevertheless, it was only a few years after Amos's invention that wheelwrights all over the country were turning out his "Improved Patent Warranted Accelerating Wheel Heads." I have several fresh minted as of yesterday "Made and sold by" A. Hopkins, Chesterfield, N. H.; J. Z. Rust & Co.; Pierce & Company, Chesterfield Factory. All bear the printed admonishment: "Particular care must be taken to keep them dry.—When used, they must be kept well oiled, and when new bands are required, they must be made smooth and even." So, I fancy, Amos tried to insure the efficiency of his head.

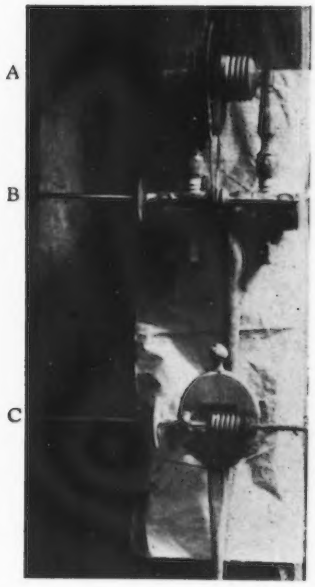
The relation of this "accelerating head" to the speed of the revolution of the spindle, as between old type and new, and also to its speed as compared with the spinning speed of the small or flax wheel might make an interesting computation. It would have a bearing too on the traditional cuts of wool spun between "sun-up and sun-down," as well as on the amount spun per hour. This spinning day has an indefinite sound at best; now must one not figure the date of that day not only by month but by year? Was it a summer's day or a winter's day? And did it antedate or postdate Amos's truly revolutionary invention in 1803?

There remains to add one item of human interest: Amos Miner was the fifth in direct descent from Thomas Miner, emigrant of the Arabella, pioneer of Connecticut, whose diary (with that of his son Manasseh, the weaver) is a classic in its record of a colonial farm.

The American Rifle—Continued

Paul Revere & Sons made brass cannon to various standard sizes for the United States Navy and Army. The iron founders of Pennsylvania, in 1777, were casting standard size cannon balls for the Continental artillery. The making of guns is one thing—the making of ammunition is another. The history of the DuPont Company epitomizes the mass production of powder in America, but Paul Revere, during the Revolution, was a powder maker. The making

Continued on page 102

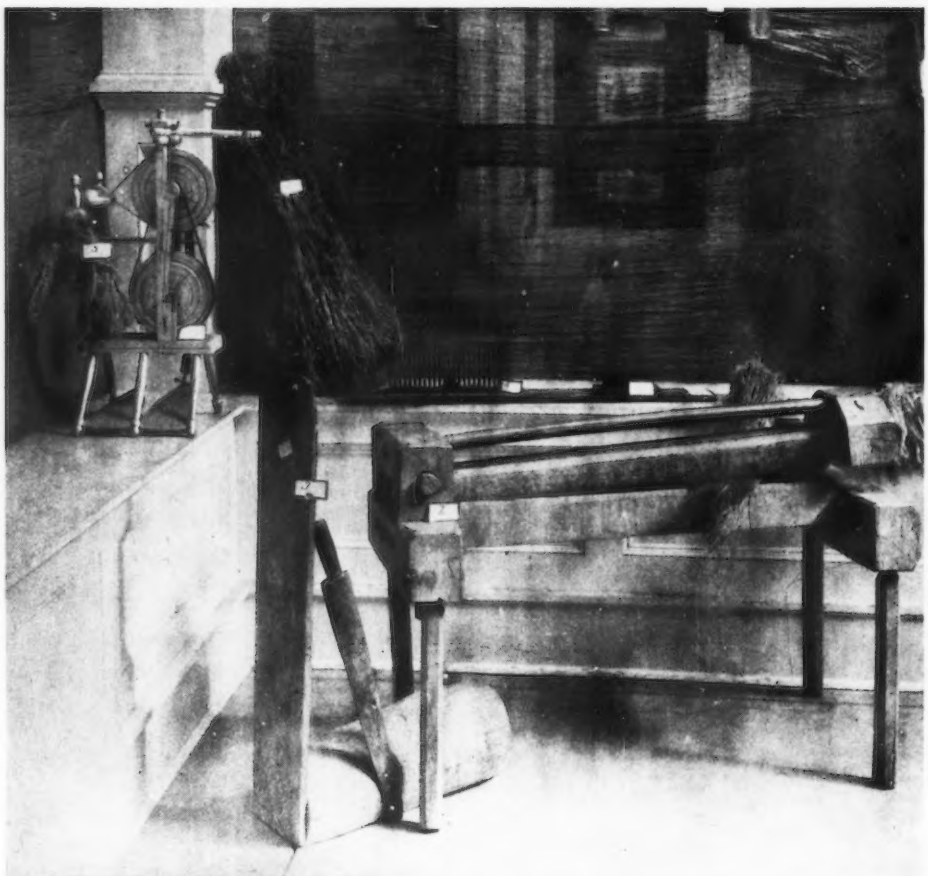


Miner's Head vs. Old Head

A = upper small (accelerating) wheel of Miner's wheel head.

B = small pulley or whirr in shaft of spindle (in both wheel heads).

C = separate cord gearing upper accelerating wheel A to small pulley or whirr B in Miner's wheel head.



A collection of flax-working implements.

Flax and the Loom—Continued

along the edge of a plank, thus removing most of the broken waste; and finally it was "hetcheled" (always a handful at a time) by drawing it over and through the many-toothed hetchel, thus cleaning it and combing it out into a beautiful smooth strand of soft gray fiber—the dressed flax. Hetchels of different sizes and fineness were used, the small close-toothed ones producing a finer and more beautiful product. Judged by our standards of patient industry, the process must have been almost infinitely laborious.

The short and broken fiber that was not so well cleaned was called "tow," and was very much less valuable than the long clean fiber of the dressed flax. However, it was roughly spun and found a place as "filling" or woof in the poorer fabrics, the warp being supplied by the long flax. A chance sentence from an early writer in the *Cultivator* indicates that when handled according to the usual methods of those times, the yield of tow was commonly about one-half the weight of the dressed flax.

The per acre yield of the fiber varied as widely as any other crop. The figures of the 1845 census for the total product of flax fiber, divided by the total acreage, indicate a yield of only about sixty-two pounds of dressed fiber per acre. On the other hand the letter written by "B," heretofore quoted, speaks of 250 pounds, and I find one Connecticut Yankee reporting yields as high as 350 pounds per acre. It is evident that some exceptional men obtained yields far above the average. Flax was recognized as requiring a fertile, well-drained soil and yet it is certain that it was produced in quantities sufficient for home needs upon the very poorest of hill farms. Chance references to the weight of straw that would grow upon an acre lead me to believe that the yield of the dressed flax fiber was only about ten per cent of the weight of the flax straw.

In the days of our earliest agricultural journalism dressed flax was one of the few commodities the price of which was regularly quoted in the very brief and primitive market reports of that day. Grown primarily to supply the needs of the home it is evident that there was sometimes a surplus and that this enjoyed a cash market along with wheat and corn and wool and potash. During a period of ten years I find quotations ranging from seven to thirteen cents a pound. Price varied according to quality and it might be reckoned a very stable commodity.

The Flax Wheel

As has been said, the flax wheel was once found in every well-ordered farm home, and while some of them have been irreverently destroyed and more of them have been "collected," yet there must still remain many thousands of these honorable implements hidden away in the garrets of the old farmhouses of our state. The wheels still survive but almost the last of the cunning-fingered women who knew their use has departed. There still remain among us a considerable number of women—some of them not very old—who can deftly spin carded wool on the wool spinning wheel. This is because in the evolution of our handicrafts, the spinning of wool persisted for a generation after the spinning of flax had become a lost art.

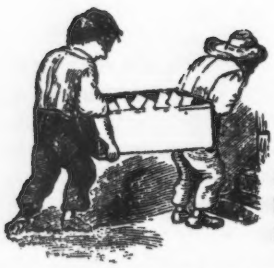
As a matter of fact, there is almost no resemblance between the flax and wool wheels, and the machanics of the two operations are entirely unlike. The flax spinner sat at her work while her skilled fingers separated out and constantly fed to the foot-turned reel a succession of long filaments drawn from the heavy strand of dressed flax that was thrown over her distaff. All in all it was a fine and gracious art and one in which our foremothers achieved an astonishing proficiency.

High up in the hill country of southern Schoharie County is the one-time prosperous and now almost deserted hamlet of Eminence. Hard by in an old farmhouse lives one, Miss Hattie Felter, in whose knowledge the lore of flax spinning still survives and who can today demonstrate the use of the wheel as in the long ago.

Among our old-time farm families, whose ancestral roots run back across the years to early farm occupancy, there are still to be found very many beautiful examples of linen wrought from home-grown flax carried through all the stages of manufacture, spun in the farm kitchen and woven on the family loom. To me a fringed linen tablecloth or beautiful bedspread with such a history, if in the possession of the family who made it, seems almost like a patent of nobility.

Weaving is one of the most primitive and ancient of arts and the modern loom has evolved into a wonderfully intricate and complex machine, yet on the huge and clumsy "barn-frame loom" of a century ago our grandmothers achieved fabrics which bear the stamp of genuine artistry. Of colors they had

Continued on page 101



The Chronicle

issued occasionally for members of

EARLY AMERICAN INDUSTRIES ASS'N

The purpose of the association is to encourage the study and better understanding of early American industry, in the home, in the shop, on the farm, and on the sea, and especially to discover, identify, classify, preserve and exhibit obsolete tools, implements, utensils, instruments, vehicles, appliances and mechanical devices used by American craftsmen, farmers, housewives, mariners, professional men and other workers.

Communications regarding the contents of The Chronicle should be addressed to the Editor; Suggestions for members and other matters either to the President or the Secretary-Treasurer.
MEMBERSHIP: Beginning January, 1945, regular membership will be $2.00.
Supporting Members contribute $5.00 or more a year.
BACK NUMBERS of The Chronicle are available in some instances for fifty cents or one dollar, depending on rarity. The Index to Volume I is available for one dollar.

Editor's Note:

Chapters

At the New York meeting last spring, and at the Sturbridge meeting in the fall, there was considerable discussion on the development of Industries Chapters. The Sprague Chapter, Number 1, in New Jersey, has been organized for a number of years. Now we have the report of the formation of the Worcester County Chapter in Central Massachusetts, and at the present time there are under consideration chapters in Wisconsin, Ohio and Central New York.

The report from New Jersey Chapter follows:

Sprague Chapter Number One of the Early American Industries Association held its first regular meeting since 1942 at the Newark Museum in New Jersey. Introductory remarks were made by the chairman, C. Carroll Palmer, regarding the interesting meeting held recently in Sturbridge, Massachusetts.

Miss White of the Newark Museum Staff traced the preparation of flax, cotton and wool for weaving on looms. She demonstrated looms and told of dyes made from Indigo, Madder, walnut bark and nuts and also parsley. The blue paper on cone sugar was often soaked for dye. A number of single and double woven coverlets were hung on racks to show patterns and colors. It took eight spinners to provide enough thread for one weaver's day's work. The spun thread was measured on clock reels or niddy noddys. The applewood or boxwood shuttles, smoothed and perfectly balanced, held the thread wound on quills, sticks or rolled paper. Carpenters often constructed the looms while the spinning wheels were largely the product of the wheelwright and peddled by him throughout the rural sections.

Members exhibited and discussed a number of interesting objects. Mrs. Stretch had a wrought iron toaster fork, flame carrier, grease lamp, rocker ice skates and a large print block with metal design which was marked "J. P. Coates." Mr. and Mrs. Tallmadge showed an apple corer, handled utensil, bone handled forks and an embroidered wide ribbon. Miss Netter brought a wooden clothes wringer. Mr. Palmer presented a matched skimmer and dipper, cake turner marked "A. Brown," meat forks, mincing knife, tin noodle gun, tin cutters, tin combination sugar shaker, iron sugar nippers, dough box scraper, wooden cookie rolling pin, rag rug shuttle, rocker ice skates and a D-form bag holder or opener.

A conducted tour of the Fall Exhibit entitled, "Owned in New Jersey" finished the afternoon meeting.

"The Worcester County Chapter is affiliating in an informal way with the Worcester Historical Society. A letter received by Warren C. Lane, past President of EAI, from Charles I. Foster of the Worcester Historical Society, contains an outline of the relation between the two organizations which will interest others planning to form chapters.

The Worcester Historical Society offers to the Association the use of its library and museum facilities and the hospitality of its rooms for meetings. The Society will accept to the limits of its space such property of the Association in the form of library and museum pieces as the Association may wish to deposit. Such articles will be held by the Society

under the terms of its printed contract of deposit. The Society also stands ready to make reasonable loans of its accessions to the Association.

The Society will offer to the Association space in its museum in which the Association may stage exhibits for the education of the public in early American arts, crafts and industries. Such exhibits will be subject to the approval of the Society's director to assure their conformity to the general scheme of treatment, but they will bear a placard stating that they are the work of the Association.

The Association will assist the Society in cataloging its accessions and deposits within the field of the Association's interest.

The Association will encourage its members to become also members of the Society and this interest will be reciprocated.

What is proposed here is an informal working agreement between the Worcester County Branch of the Early American Industries Association and the Worcester Historical Society for their mutual convenience and prosperity. If either party should conclude that this end is not served, the arrangement may be freely terminated."

Membership

Membership lists should be amended as follows: (N) indicates new member; (D) indicates decease.

DISTRICT OF COLUMBIA

Washington, D. C.: Way, Elwood J. (1469), 1703 New York Avenue, N. W. (N)

MASSACHUSETTS

North Cambridge: Carlton, W. M. (1468), 173 Harvey Street. (N)

Sheldonville: Anderson, Mrs. E. R. (1467), West Street. (N)

NEW HAMPSHIRE

Lisbon: Barbour, Alexander (335). (D)

NEW JERSEY

Middlebush: Archibald, Lauren S. (1321). (D)

NEW YORK

New York City: Heidelberger, Mrs. Michael (227), 333 Central Park West. (D)

RHODE ISLAND

Providence: Clarke, Mrs. B. Earl (1466), 18 George Street. (N)

WEST VIRGINIA

Elkin: Darby, H. M. (28). (D)

Flax and the Loom—Continued

no great choice. They surely had no coal-tar dyes of a thousand different shades sold in ten cent packages. From their own fields and woodlands they had certain sources of soft coloring—walnut hulls and butternut bark and onion skins—but indigo was their main dependence, so most of their patterns were wrought in blue and white.

Well have the botanists chosen for flax the scientific name *Linum usitatissimum,* which means, "most useful." As a source and aid to human progress it must be enumerated among the half dozen most important plants in all the world. Fortunately for mankind it seems to thrive under very wide variations of climate and is successfully grown from the tropics to well toward the northern limits of agriculture in Scandinavia and Manitoba. It is in the cooler climates, however, that it attains the highest quality of fiber. Its use is one of the old, old discoveries of the race. The Swiss Lake Dwellers passed so long ago that no archaeologist ventures to set their date in history; but dredging on the site of their homes bring up fragments of their fishing nets, and skilled microscopists establish the fact that these were made of the indispensable flax.

The Mediterranean Basin was the cradle of civilization and there the flax plant everywhere found a home. It furnished the winding sheet for the kings of the men who piled up the pyramids, and the Assyrian and the Greek went clad in the same universal fiber that made the shirt and the kirtle of the American pioneer.

Flax is the premier textile plant of the world. Other cheaper and far inferior vegetable fibers have very largely displaced it for the commonplace uses of life; but when men want strength and durability, when they want beauty, as in table linen and in altar cloths, then they turn back again to this imperial plant.

Flax fiber when first prepared and spun and woven may be of varying colors, but always some soft and lovely shade of gray. Our grandmothers bleached it in the sun until it became almost white, practically without loss of strength. Modern bleaching with boiling and chemicals attains an almost snowy, gleaming whiteness but at the cost of durability. Compared with flax, cotton is at best weak and short-lived. Cotton fabrics grow rotten and weak with the passing years but linen literally survives the centuries. For sheer strength a slender thread of twisted flax fibers is incomparable. Woven alone and

made into shirt or dress or sheet it made a fabric well-nigh indestructible—literally an heirloom to be handed down through the years. Used as warp to protect and hold the honest woolen woof, it made clothing that kept out the cold or bedding beneath which the pioneer in his rude cabin home might at least lie warm o'nights. Some day a great poet will arise who will be worthy to sing the Saga of the Flax.

Less readily than wool did flax adapt itself to machine methods. The manufacture of wool slowly and by degrees passed out of the home to the factory, but in our state at least the handling of flax and the weaving of linen always remained a household handicraft and passed away with the coming of the machine age. So it has come at last that a crop, an art, a handicraft which less than a century ago was well-nigh universal is today as forgotten as the quill pen or the tinder-box and flint and steel.

The American Rifle—Continued

of bullets and balls for rifles was achieved by molding in either single or multiple hand molds. Shot was quite easy to make on a mass production basis in shot towers. Large cauldrons of molten lead were poured through screens of various mesh down the inside of the tower. The molten lead was broken into tiny pellets of various sizes by passing through the mesh, and fell into a well of cold water. Several shot towers were erected along the Mississippi and one is still standing at Dubuque, Iowa. The largest shot tower ever built in this country was on the banks of the Schuylkill, near Philadelphia. This shot tower, for at least a score of years, produced enough shot to supply the needs of the entire country. Several ingenious inventions and devices were used for the repetitive firing of repeating pistols before the invention of the cartridge, which carried its own percussion cap. Strips of small caps were hidden in the grips of pistols and served the purpose of firing each of the specially loaded chambers. It is a matter of record that the making of these strips was a mass production operation, by a machine which automatically dropped small pellets of fulminate on strips of paper fed through a machine which glued the fulminate between an upper and a lower layer of paper.

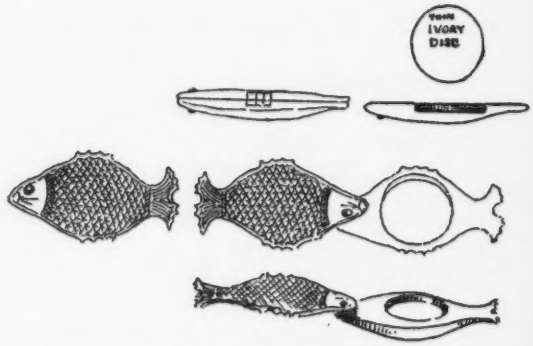
Communications:

From Horace M. Mann, Bucks County Historical Society:

"While I am not sure that Mr. Malcolm Vaughan's inquiry on the butter tester refers to the same article that I have in mind, I am enclosing some sketches of a small specimen which I call a 'butter taster.'

It is made of two hinged sections of mother-of-pearl. The bottom section is cut out to hold a thin ivory disc. When the lady went to market she scraped off a small sample of butter offered for sale to taste for proper flavor. The disc was carried in the mother-of-pearl case to prevent soiling her pocket or handbag. This practice was finally forbidden as unsanitary.

I have no data on the age of this case. It must have been used when butter was brought to market in bulk and weighed out as required. The advent



of prewrapped butter would have eliminated it if the health authorities had not done so."